

Antiderivatives and
Indefinite Integration Homework

Name _____

Find the indefinite integral and check the result by differentiation.

1. $\int (x^3 - 2) dx$

2. $\int \left(x^{\frac{3}{2}} + 4x + 1 \right) dx$

3. $\int (\sqrt[3]{x^2} - 1) dx$

4. $\int \frac{1}{x^4} dx$

5. $\int \frac{x-3}{\sqrt{x}} dx$

6. $\int (y + 3)y^2 dy$

7. $\int 5 dt$

8. $\int (3 \cos x - 2 \sin x) dx$

9. $\int (3 + \sec x \tan x) dx$

10. $\int (x^3 - 2) dx$

11. $\int 5 \sin x - 3e^x dx$

12. $\int (6x^2 + 3e^x) dx$

13. $\int (\tan^2 \theta + 1) d\theta$

14. $\int (\cos x + 5^x) dx$

Solve the following differential equations.

15. $f'(x) = \frac{1}{\sqrt{x}}; f(0) = 3$

16. $f'(x) = 6x^2 + 4x; f(1) = -1$

17. $f''(x) = 4; f'(3) = 7; f(3) = -1$

18. $s''(t) = -32; s'(0) = 58; s(0) = 92$

19. $f''(x) = \sin x; f'(0) = -1; f(0) = -4$

20. $g''(x) = x^{-\frac{3}{2}}; g'(4) = 2; g(4) = 6$